

Checklist

Step-by-step project management

Part I: Start of project

Checklist for implementing an electrical installation with KNX

Project:		Distribution board:	
Project no.:		Date:	
Distribution board:			

1) Your question	Customer response
What does your customer want their living space to be like?	
For your customer, what are the most important characteristics that a house should have?	
Who will be living in the property?	
Give your customer a little homework to do: how will the rooms be used, and by whom?	
Basement: <ul style="list-style-type: none"> <input type="checkbox"/> Storeroom <input type="checkbox"/> Hobby/craft room <input type="checkbox"/> Utility room <input type="checkbox"/> Laundry <input type="checkbox"/> Gym <input type="checkbox"/> Corridor <input type="checkbox"/> Garage 	

Only once your customers are clear about how their various rooms are to be used will you be able to offer them an effective, intelligent building automation system.

Examples:

- Storeroom → Motion sensors
- Hobby room → Vacuum cleaner
- Gym → Air conditioning + air quality
- Laundry → Leak alarm
- Conservatory → Shading, ventilation, temperature control

Ground Floor: <ul style="list-style-type: none"> <input type="checkbox"/> Hallway/corridor <input type="checkbox"/> Downstairs toilet <input type="checkbox"/> Kitchen <input type="checkbox"/> Dining room <input type="checkbox"/> Living room <input type="checkbox"/> Lounge <input type="checkbox"/> Conservatory <input type="checkbox"/> Terrace 	
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Checklist for implementing an electrical installation with KNX

First floor:

- Corridor
- Bathroom
- Children's bedroom 1
- Children's bedroom 2
- Children's bedroom 3
- Playroom
- Master bedroom
- Walk-in wardrobe
- Balcony

Attic floor:

- Studio
- Gallery
- Room 1, 2, etc.

2) Your query

Results

Define a lighting plan for each room, on the basis of 1): What devices need to be switched? Where is dimming required?

On the basis of 1), define a plan for controlling blinds, windows, doors and gates, and specify their function.

Discuss with your customer a safety and security concept, and identify consequences.

Example:

If internal activation is selected, the client must not open the window, because this would set off an alarm.

Example:

If a passive trap system with motion sensors is to be used, there must be no pets in the house.

Determine whether there are further technical devices that need to be controlled via/ connected to the building automation system:

- Swimming pool
- Rainwater utilisation
- Heat pump
- Photovoltaic system
- Hot water convectors
- Central vacuum system
- Garden watering systems
- Home cinema
- etc.

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3) Customer tasks	Results
Ask your customer to define, on the basis of 1), what controls are required in each room. (Explain to your customer that he or she must think in terms of functions rather than in terms of conventional switches).	
Point out to your customer what controls might be needed in the future.	
For example, when the use of a room changes after children have left home, when furniture is rearranged, or if family members move in who have special care needs.	
4) Together with your customer, define operating philosophies	Results
e.g. for push-button sensors: left for on, right for off, central functions always at the bottom. Also: Use of status LEDs	
Remote controls	
Central control panels/touch displays/visual displays	
Room temperature controllers	
Date and signature, installer:	
Date and signature, customer/user:	

Supplementary sheet for other possible applications (list not exhaustive)

I. Switching and lighting (all lamp types)

- I.1. Switching from one or several locations.
- I.2. Central switching, e.g. light off, iron off and cooker off at entry door.
- I.3. Dimming from one or several locations.
- I.4. Staircase switching – time-delay switch-off.
- I.5. Toilet switching – time-delay switch-on and switch-off of fan.
- I.6. Switching on and off of devices via timer programmes.
- I.7. Switching on and off of sockets for temporary or potentially dangerous devices (e.g. rotary iron), but also to reduce power consumption by appliances in standby (TV, stereo, etc.)
- I.8. Motion-dependent switching for corridor area, side rooms and outdoor areas.
- I.9. Daylight-dependent switching on and off of lighting via internal or external light sensors helps to save energy.
- I.10. Preset scenarios allow several switchable or dimmable groups of lights, other devices or blinds to be changed to a predefined status at the touch of a button. Scenarios can be defined by the system integrator or the user.
- I.11. Panic button, e.g. by the bed. When this is pressed, predefined lights are switched on to deter any intruders.
- I.12. Status notification: depending on the actuator, statuses of devices can be displayed on e.g. push-button sensors, displays or visual displays.



Supplementary sheet for other possible applications (list not exhaustive)

2. Screens, shading and light deflection

- 2.1. Raising and lowering of blinds and adjustment of slats. The advantage of bus technology is that several blinds can be controlled via a single push-button sensor. This increases transparency and saves space. Light and blind functions can also be controlled via a push-button sensor.
- 2.2. Central raising and lowering of blinds or shutters – for an individual facade, floor, or for the entire house.
- 2.3. Preset positions at the touch of a button, e.g. to protect against glare when watching TV, or at PC workstations in studies or in children's rooms.
- 2.4. Weather-dependent control: protection of awnings, sun shades and other facade elements against damage by wind, rain and frost based on evaluation of weather data. For example, the awnings will retract if wind speeds are too high, and manual operation will be prevented.
- 2.5. Solar shading: brightness and/or temperature sensors close the shutters or blinds far enough to prevent excessive heat from entering and to protect plants/furniture from damaging UV radiation, but keep them open wide enough to allow sufficient daylight to enter.
- 2.6. Control of facade elements via timer controls – with no need for additional cabling.
- 2.7. Scenarios allow roller and other blinds to be moved to specific positions at the touch of a button, often in combination with lighting, e.g. dim lights and move blind to relevant position when watching TV.
- 2.8. Status notification: depending on the actuator, the statuses of facade elements/blinds can be displayed on e.g. push-button sensors, displays or visual displays.



Supplementary sheet for other possible applications (list not exhaustive)

3. Windows, skylights, doors etc.

- 3.1. Opening, closing and selection of intermediate positions for (roof) windows and skylights. The advantage of bus technology is that several windows can be controlled via a single push-button sensor. This increases transparency and saves space. These functions can also be combined with light or blind functions.
- 3.2. Central opening and closing of (roof) windows, skylights and doors for each side of the building, a particular floor, or for the entire house.
- 3.3. Weather-dependent control: protection of windows and roof windows from wind, rain, frost. Protection of rooms, e.g. by automatically closing roof windows when it rains, is also possible.
- 3.4. Brightness, temperature or air quality-dependent switching, for example to automate the functions of a conservatory. If the temperature exceeds a preset value, the shading will be activated and the ventilation windows opened. The ventilation windows can also be opened if the concentration of CO₂ reaches too high a level.
- 3.5. Windows, skylights and doors can be opened or closed at specified times via timer control. Timer controls can be used in conjunction with measured internal and outdoor temperatures in order to achieve automatic night-time ventilation.
- 3.6. Status notification: depending on the actuator, statuses (open, closed or specific intermediate position) can be displayed on e.g. push-button sensors, displays or visual displays.



Supplementary sheet for other possible applications (list not exhaustive)

4. Heating/cooling

- 4.1. With individual room regulation, a target value can be defined and modified for each room. If the resident is out of the house for a short time (shopping, doctor's appointment, etc.), the room temperature can be reduced by e.g. 2 °C, or e.g. 4 °C at night. (A reduction in room temperature of 1 °C corresponds to an energy saving of 6%).
- 4.2. Integration of window contacts: when a window is open, the room temperature controller switches to frost protection mode. This ensures that no energy is used to heat the outside air and, particularly in winter, that the room is protected against frost.
- 4.3. The amount of energy used can be reduced by connecting the individual room controllers to the heating/cooling system: thus if only one or two rooms need heating, the supply temperature can be reduced (for heating) or increased (for cooling).
- 4.4. Incorporation of various energy sources (fossil and renewable): limit values can be defined in order to allow the most favourable energy source to be used automatically. The system can thus determine whether the temperature of the solar panels is higher than the water temperature in the hot water tank. If so, there is no need to use fossil energy for the water heating. For cooling, the application described under 3.5 can be used.

5. Ventilation

- 5.1. Automated, monitored ventilation of living space, e.g. for low-energy or passive houses. Can also be implemented in conjunction with CO₂ sensors to maintain optimal air quality.
- 5.2. Measurement of indoor and outdoor temperatures allows, for example, the thermal energy of the outlet air to be recovered in case of low outdoor temperatures.
- 5.3. Control of air extraction devices in kitchens, bathrooms, toilets and hobby rooms on the basis of motion sensors or in combination with lighting control.



Supplementary sheet for other possible applications (list not exhaustive)

6. Alarm functions

- 6.1. Monitoring of the outer shell of the building via magnetic contacts on windows, doors and gates, or via glass breakage sensors.
- 6.2. Monitoring of the interior by motion sensors.
- 6.3. Monitoring of the area around the house by motion sensors.
- 6.4. Incorporation of room sensors into the alarm system.
- 6.5. Via a panic button, a silent alarm can be triggered in case of a break-in, in order to send a notification to e.g. the guard service by retransmission (by telephone, SMS or email).
- 6.6. Presence simulation creates the impression that the house is occupied when it is in fact not. Depending on the time of day and/or brightness, or for example at dawn or dusk, specific lights can be switched on or blinds can be opened or closed.
- 6.7. Via a push-button, for example by the bed, all preset lights can be switched on in order to deter intruders.
- 6.8. If the alarm is triggered, all lights inside and outside the house will switch on, and all blinds will be opened.
- 6.9. Activation devices allow the alarm system to be activated either internally or externally. External activation can be combined with a sequence of further functions to activate “leave house” status. This can include switching off critical appliances, blocking controls, reducing room temperatures and/or activating presence simulation. When the alarm is deactivated, the “coming home” sequence can be activated, whereby all the functions activated when the alarm is armed are negated and, for example, a basic level of lighting is activated.
- 6.10. Pictures from video cameras displayed in visualisation interfaces show who is at the door.



Supplementary sheet for other possible applications (list not exhaustive)

7. Comfort and safety functions

- 7.1. The use of SELV* supply voltage for the bus system serves to reduce electromagnetic radiation compared to conventional 230 V or Powerline installations.
- 7.2. Switch relays can be used to disconnect circuits automatically in order to also prevent these lines from emitting electromagnetic radiation.
- 7.3. Automatic watering of the garden is possible, with activation via pumps or valves. This can be controlled by a timer or on the basis of measurements of the dampness of the soil.
- 7.4. Potentially hazardous devices (irons, rotary irons, cookers, external power sockets, etc.) can be disconnected simultaneously via central switch-off.
- 7.5. Notification of the status of intelligent household appliances (washing machines, dishwashers, refrigerators, freezers, etc.) to a display element. This allows malfunction to be detected quickly.
- 7.6. In the future: measurement of electricity, gas and water and automatic comparison of energy suppliers' prices allows appliances such as washing machines or dishwashers to start only when the most favourable rate is available.

* SELV = Safety Extra Low Voltage



Supplementary sheet for other possible applications (list not exhaustive)

8. Overview of available control and display options

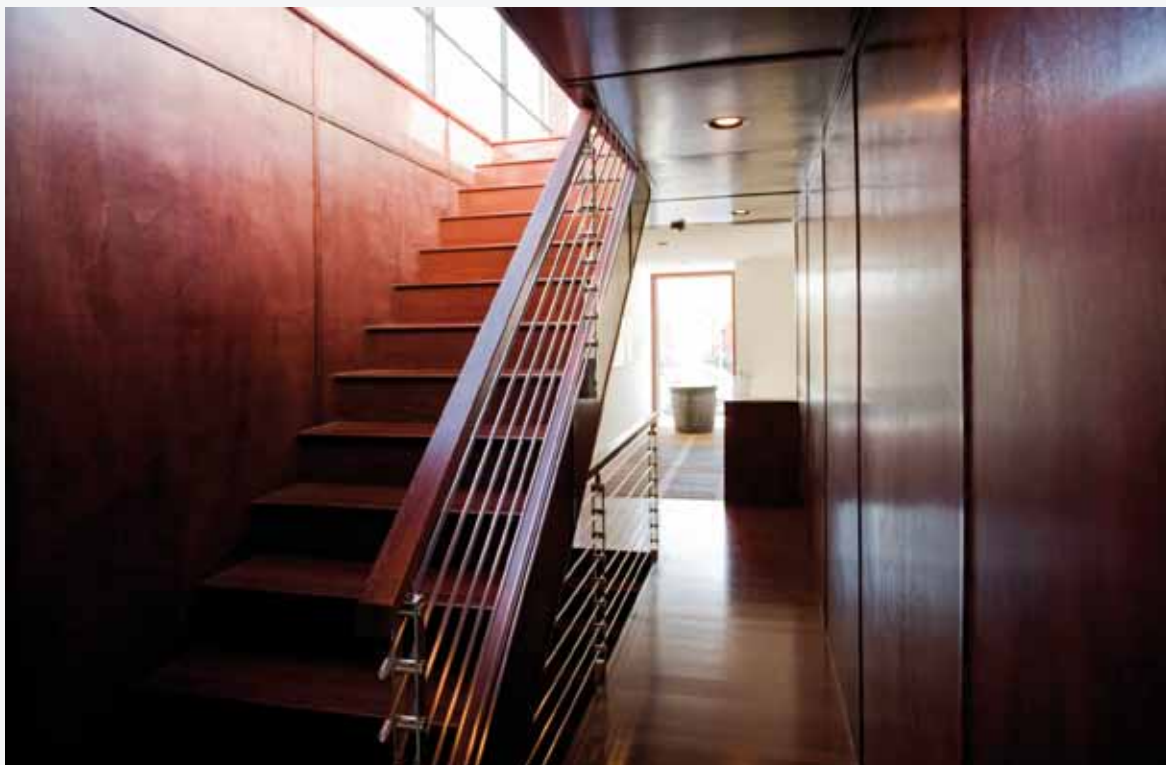
- 8.1. Push-button sensors with up to eight different controls on a surface area of a normal switch.
- 8.2. Use of the status LEDs on push-button sensors – particularly to display status, in cases where no biofeedback is available.
- 8.3. Infrared remote control units for room-specific execution of commands.
- 8.4. Radio remote controls for inter-room execution of commands.
- 8.5. Backlit LCD displays of the size of a push-button sensor can be used to manage devices and display their statuses.
- 8.6. LCD touch displays are available for large-format, comfortable overviews and for controlling individual subsections of the house automation system.
- 8.7. PC-/IP-based visual displays provide extensive overview and control functions.
- 8.8. Remote access can be set up online.

9. Ports and gateways

Via ports and gateways, applications and functions which are not provided by bus components can be integrated into the KNX system.

Examples:

- Conventional mechanical contacts via push-button interfaces
- Ethernet via IP interfaces
- DALI via gateways (subordinate lighting control system)
- Applications and functions, which are not provided by bus components can be integrated into the KNX system via ports and gateways
- Stereo/TV via manufacturer-independent gateways





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